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SMALL FRUITS for SUMMER INCOME

A Succession of Small Fruits, Especially Such as Are Adapted to the Requirements of the Home Market, Will Serve to Increase the Annual Fruit Income and Keep the Fruit Farm Help Employed at Productive Labor Over a Longer Period of the Season.

By D. S. RUNNELLS

Farm Editor, Grand Rapids Press

A FEW YEARS ago Dr. David Friday, the noted economist, then president of Michigan Agricultural College, startled the agrarian world with the statement that the home market offered the farmer his surest opportunity for profit.

Agriculture then, as now, was down in the "dumps," perhaps not as deeply at present as then, and Dr. Friday's advice on the farm problem gained widespread publicity. Few fruit growers, however, heeded his advice, and recent travels over Michigan indicate that few farmers in other lines of agriculture have put the economist's teachings into practice.

But here and there in western Michigan are occasional farmers, mostly fruit growers, who suspected the college president's statement had an inkling of truth hidden in it. They began to study their home markets. Some adjusted their production programs to local requirements. Their success is the excuse for this article.

These farmers asked themselves a few pertinent questions, like these:

What is the home market? What can I produce for the local market at a profit? Who will buy what I produce and pay a fair price for it?

The answers to these questions have lifted a few farmers, perhaps hundreds of them, off the road to failure and directed them along the highway to prosperity. Some are operating fruit farms near canning factories; others have places within driving distance of large consuming markets; still others have found ways to attract truckers and tourists to their farms. Invariably, wherever a fruit grower has shifted his program from supplying the large terminal markets—the dumping ground of the nation—to one of supplying the home market, he has found a golden route out of the rural depression.

I have in mind an orchardist near Fennville, the apple capital of Michigan, who was growing all tree fruits about the time Dr. Friday was preaching the gospel of the home market as the grower's economic salvation. This farmer virtually had all of his eggs in one basket. When tree fruit prices were high and he had a good crop, he made a "killing." But usually he had short crops when prices were high and large crops when prices were low. He was down in the "dumps" along with agriculture. He was just one of thousands of farmers who were cussing the farming business. Dr. Friday's advice made him mad—hopping mad at first, but the more he thought over the "home market" idea, the less angry he grew. He began to study his home market and today, this farmer is one of the few fruit growers in Michigan who have found a way to greater profits from the fruit business. He has virtually doubled his gross income through supplying the home market.

Almost invariably, wherever a fruit grower has shifted his program to supplying the home market, his income begins to pour in at strawberry time in the spring, instead of at cherry time or peach time during the summer, or at the apple harvest in the fall.

Briefly, here is what this orchardist has discovered, somewhat to his surprise and gratification.

That there is a home market for summer fruits.

That it is possible to grow a number of small fruits on his farm without seriously disrupting his orcharding program.

That small fruits will keep his labor and high priced equipment more fully employed, thereby reducing his overhead.

That all crops may not return a profit, yet by keeping labor employed, they help swell the gross income and help materially in making the farm operations show a profit at the end of the year.

The orchardist adjusted his production program to his "new" possibilities. He planted a few acres to strawberries and raspberries. He added to his plantings of cherries and peaches.

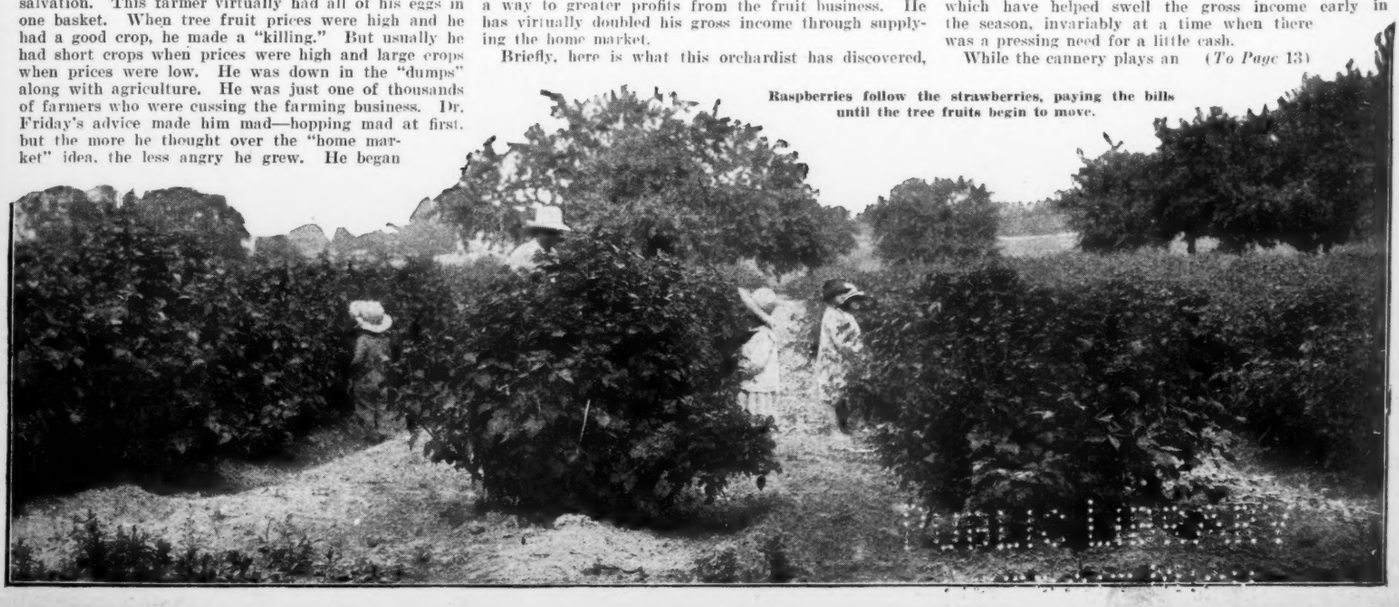
The canning factory is the home market to which he has been catering since Dr. Friday made him mad. Now his income begins to pour in at strawberry time in June instead of at cherry harvest in July and August. Raspberries follow the strawberries, keeping the labor employed and paying the bills until the first of the tree fruits—cherries—begin to move.

There have been seasons since this farmer started to serve the home market that the small fruits paid out better than his tree fruits. There have been two years when the small fruits tided him over the winter, chiefly as a result of the peaches and apples freezing out.

As he now reviews his recent operations, he begins to appreciate the dividend which the home market, plus greater crop diversification, has brought him. The summer fruits have contributed to make the "lean" years less lean, and have done much to lift him out of the rut of having all his eggs in the tree fruit basket.

Other orchardists in western Michigan have found a measure of farm relief by adding small fruits to their production programs. Some are growing currants and gooseberries, as well as strawberries and raspberries. Some have small plantings of asparagus which have helped swell the gross income early in the season, invariably at a time when there was a pressing need for a little cash.

While the cannery plays an (To Page 13)



Raspberries follow the strawberries, paying the bills until the tree fruits begin to move.

SUCCESS with the STRAWBERRY

In This "Decalogue of Strawberry Culture" Are Laid Down the Ten Points That Must Be Observed to Insure Success with Strawberries.

By PAUL THAYER

Late of Pennsylvania State College.

WITH the wealth of books, bulletins and special articles in magazines and newspapers on the subject of strawberry growing, it would seem that there is little more that could be said. However, it may be that in this wealth of material there is an element of danger. There are many ways of growing strawberries. Horticulture is an art and not a science and for this reason there are many combinations which will produce success. There are, however, certain guide posts, or as the mariner would say, range lights, which one must keep distinctly in view in endeavoring to attain a successful outcome. I have selected 10 of these and have seen fit to denominate them "A Strawberry Decalogue."

I. Strawberry Growing Is Intensive

Strawberry growing is like matrimony in that it "is not lightly to be entered upon." After reading the nursery catalogs and contemplating the wonderful fortunes that we are letting slip through our fingers by our lack of vision, we are apt to order more plants and lay out a greater acreage than we in our saner moments under the hot August sun will approve. Our zeal and enthusiasm are apt to wilt under the summer sun, much as we fervently wish the weeds infesting the berry patch would wilt.

Let us not talk and think about the number of acres of strawberries we grow, but rather focus our attention on the number of bushels. I once asked an eminent authority how many strawberries could be grown on a measured acre and he replied that this had never been determined. He was right. We do not know what are the latent possibilities of an acre of land when given intelligent care by a loving gardener. May I give you a few figures, not to interest you, however, in embarking in the strawberry game as a short road to riches. The fields of which I shall tell you were well watered with human sweat and the results, while very pleasing to the workers, were not achieved without tired backs and aching muscles. The reason I mention them here is in an endeavor to impress upon you the fact that strawberry growing is *intensive* rather than *extensive* horticulture.

In the first place, I would introduce Elsie Artz, a 13-year-old Pennsylvania club girl, who a few years ago produced 820 quarts of berries on a measured twentieth of an acre. We thought that wonderful, and it was, but the very next year another Pennsylvania girl in the next county raised over 1000 quarts on a plot the same size. On a slightly larger scale is a crop of 150 60-quart crates (9000 quarts) that Joe Monez of Cape Cod picked from a half acre, and the record of J. M. Smith of Wisconsin, who produced 14,284 quarts from a measured acre.

II. Select a Suitable Site

This will mean reasonably level land, not too far from the buildings, well drained, free from frost danger, easily tilled—and that without danger of erosion—fertile and well filled with humus.

It may happen that the only suitable field that a *strawberry specialist* has available is one at the back of the farm. In such a case, the strawberry patch will not suffer neglect. But where a man has a number of irons in the fire and strawberries are not the major project, I usually feel that a walk to the back of the farm to see his strawberry patch is a waste of effort.

III. Avoid Land Liable to Be Infested

Few can overcome the handicap that white grubs or quack grass furnish. But, how are we to know whether the land is grub infested or not? You cannot know with certainty and yet you may be sure that you are running into danger if you plant on land that has been in sod, especially timothy sod, during the past two seasons. The white grub is the young of the "May beetle" or "June bug" of our early summer evenings. In selecting a place to lay its eggs, the May beetle seems to prefer an old bluegrass or timothy sod. During the next two summers, the grubs live in the sod field, feeding on the roots of the grass or, if the sod is broken up, on the potatoes, strawberry plants or whatever living roots there are to feed upon. It is not rare to find a dozen or more grubs under a square foot of old sod, and as one grub can easily destroy two or three strawberry plants, the menace of the white grub is easily seen. The man who plants on a quack grass sod does not have a sporting chance. Other weeds may not be quite as bad, but the man who sets a field to strawberries knowing it to be infested with morning glory, Canadian thistle, or other noxious weed is only piling up trouble for himself. The man who has foresight and can look two years ahead, arranges for such crops as soy beans or potatoes to occupy the ground the two years previous to planting.

IV. Select Proper Varieties

If you are in a carlot shipping com- (*To Page* 14)

Fig. 1.—Opening the ground to receive plant. Fig. 2.—Closing the soil about the roots. Fig. 3.—Compacting soil. Fig. 4.—Crown of plant flush with ground.

RASPBERRY and BLACKBERRY CULTURE

An Outline of Methods by Which the Grower May Establish Commercial Plantings of Raspberries, Blackberries and Dewberries, with Discussion of Cultural and Pruning Methods.

By JOSEPH OSKAMP

Cornell University.

THE FRUIT INDUSTRY generally is in a state of transition and adaptation to new economic conditions. Wide shifts in producing areas and output have taken place. The cane fruits are no exception to these trends. The western states, notably Oregon and Washington, have shown a decided increase in production. The drying industry is also migrating westward and has had keen competition from the canning field. Texas has become important in the production of blackberries, while New Jersey has suffered a decline. Berries have also been affected by competition with other fruits, especially cherries, which are now on a new basis with the advent of the freezing process.

Many growers of small fruits are being crowded out by more efficient growers, more favorably located. There seems little hope today for the grower in the eastern United States who cannot maintain an annual yield of at least 1500 quarts of raspberries per acre. In the West and South, yields have to be larger to offset the additional transportation charges.

Location of Small Fruits

Commercial planting of raspberries, blackberries and dewberries should always be located favorably with reference to good roads, nearness to shipping point or market, suitable climatic factors, and congenial soil type.

A commercial planting of Columbians.

The brambles are the most tender of the small fruits, and cannot endure as rigorous a climate as can strawberries, gooseberries or currants. Dewberries and some varieties of blackberries are especially susceptible to winter injury. Blackcaps also suffer in certain sections and during severe winters. The reds and the purple canes are the most hardy of the bramble fruits. A site that is subject to the tempering influence of a large body of water is particularly desirable for growing these fruits. Exposed locations should not be selected for this purpose. In the extreme northern sections, it may be necessary to lay the bushes down and cover them with earth or to mulch them very heavily with straw. This also applies to dewberries and to the more tender varieties of blackberries in most locations north of the Ohio River.

While these fruits will grow on a variety of soils, yet the lighter, warmer soils are to be preferred. Most of the commercial plantations are found on soil types varying from gravelly to sandy and clay loams, with the gravelly and sandy loams predominating. A deep, well-drained soil is of the utmost importance; one in which the water table does not encroach upon the root zone of the plants at any season of the year.

Blackberries will probably succeed on somewhat heavier types of soil than will raspberries. Experienced growers soon come to recognize the preference of certain varieties for particular soils. The lighter soils

have the advantage of ease of management, however, and if w[illegible]ed with humus, should prove highly desirable [illegible]majority of these berries.

Plants and Planting

The plant[illegible] be purchased from small-fruit nurserymen, or they may be obtained from established plantings in the neighborhood, in which case care should be exercised to obtain plants only from patches that have been inspected by the proper state authority. Disease-free stock is one of the all-important items in successful berry growing today.

The distance between plants will depend on the variety, the soil, the system of planting, and the amount of land available.

Not only proper spacing, but a good stand of plants is highly important in obtaining satisfactory yields.

For raspberries, three by eight feet or possibly four by eight feet is a good average distance. Some growers prefer three by nine for ease in tractor cultivation. Red raspberries are sometimes set closer in the row than are blackcaps. Reds used to be frequently grown in hills five by five, but that practice is passing with the old order. Blackberries may be spaced the same as raspberries or a foot farther apart. Dewberries are generally grown in hills, five or six feet apart each way, and trained to stakes.

Planting is best done in the spring, as early as the ground can be worked. Fall planting is sometimes practiced, in which case the plants should be protected by a back furrow or by some sort of mulch.

The rows may be laid off by plowing furrows where the rows will come, and the location of the plants in the row may be determined by a marker. The plants should be set about four inches deep in the furrow, and approximately two inches of soil should be drawn over them and tramped down firmly. The remainder of the furrow may be filled in as the new shoots develop. The setting may also be done with a spade, after marking both ways. The plants will not need much pruning at planting time, except possibly to cut the tops back to within a few inches of the ground.

Thorough cultivation is one of the essentials. It should begin as early in the spring as the ground can be worked to advantage, and should be repeated often enough to destroy weeds and suckers. Cultivation is sometimes continued through the harvest.

Tillage should be shallow. A couple of inches is sufficient for good results and yet not deep enough to disturb many roots. Hand hoeing will be necessary now and then to keep the ground between the plants clear of weeds and grass. Cultivation should be such that the rows are kept narrowed to 10 or 12 inches in width. The nature of the soil will largely determine whether the land should be plowed in the spring or worked up with a disk.

Intercrops and Cover Crops

Some low-growing crop, such as early potatoes, peas, beans or tomatoes, may be grown between the berries the first year. The second year the intercrop should be discontinued, as then from a third to a half of a crop of fruit may be harvested. (*To Page* 20)

CONSTRUCTING the AIR-COOLED APPLE STORAGE

The First of a Series of Three Articles on the Subject of Air-Cooled Storage. In This Article the Principles of Construction, Including Ventilation and Insulation, Are Fully Explained.

By CLARENCE E. BAKER

Purdue Experiment Station.

THE INCREASED importance of local and roadside marketing of fruit and fruit by-products during the last 10 years has stimulated an interest in the storage of apples on the farm. Many small growers have found that by using an air-cooled storage they have been able to hold their fruit at the orchard until the entire crop could be marketed locally, thus realizing a considerably higher price for their apples than if it had been necessary to dispose of the entire crop immediately after harvest.

Many large commercial orchardists have found it profitable to maintain a retail sales room at their orchard, or at some convenient point along a prominent motor highway. This change in the method of marketing, together with mounting freight, handling and cold storage charges has made the development of the farm storage almost a necessity, where apples provide main income.

The greatest limiting factor of the air-cooled storage is its dependence upon the weather. During the winter months it is possible to maintain a temperature that compares favorably with that of a commercial cold storage. During the warm weather of early fall, however, it is difficult to secure a temperature at which apples will keep in a satisfactory condition. This fact should be understood by those who are contemplating the construction of an air-cooled storage. Due to this limitation, it is unwise to depend too greatly on such a storage for holding large quantities of early fall varieties, such as Grimes and Jonathan, especially in the latitudes south of central Indiana.

The requirements of a farm apple storage may be fulfilled in a very economically constructed building. Frequently a barn or other building may be converted into a very efficient storage. One grower in north central Indiana has, with a very small expenditure, remodeled an abandoned brick school house into a satisfactory apple storage, packing house and sales room.

If it is deemed advisable to erect a permanent and more elaborate structure, the storage may be made a thing of beauty by the use of higher grade materials. In such a building, a packing house and sales room are frequently included. Even an attic above for the storage of ladders, packages and other orchard supplies may be added at a small additional initial cost.

Construction Materials

Due to the constant dampness present in an apple storage, wood has a comparatively short life unless it is treated to withstand moisture. This is especially true in the cellar storage.

Solid concrete, concrete blocks or glazed hollow tile may be used to advantage in the construction of storage walls. The interlocking type of hollow tile are very satisfactory, where they may be secured near enough to a source of supply that freight charges do not make their cost prohibitive. Well-designed hollow tile combine supporting strength with insulating value and are pleasing in appearance and make a strong, lasting wall.

Above. An above-ground fruit storage that has been in successful operation for 10 yearr. Below. A brick school building converted into common storage, packing house and sales room.

The amount of insulation necessary and the way in which it is used depends upon the type of storage under consideration and the degree of efficiency expected from the selected material.

Air-cooled storages usually take the form of a cellar, an above-ground structure or a combination of the two. The cellar storage is generally placed in a bank with three sides surrounded by soil and one side exposed. The exposed side should face preferably north or north east to avoid the direct rays of the sun. A portion of the fourth side may be surrounded by soil. Such a building, with solid masonry walls, is constantly radiating a soil temperature of 52 to 55 degrees Fahrenheit into the storage room, due to the fact that masonry walls in contact with the soil rapidly assume the temperature of the soil. Unless the walls and floor are insulated, it is difficult to secure satisfactory storage temperatures until very cold weather prevails. In spite of this fact, however, little insulation against ground temperatures is customarily used in this type of storage. Unless the roof of the cellar is covered with soil, the ceiling must be insulated to prevent freezing in severe weather.

Storages built entirely above ground must be thoroughly insulated to prevent the transfer of heat in warm weather and to protect against freezing in winter. It is exceedingly important in any type of storage that all doors, windows, air intake and outlet covers fit tightly, so as to preclude the possibility of any air leaks around them. Light is detrimental to the keeping quality of apples, so if artificial light is available, windows should be dispensed with. If windows are necessary to furnish light to work by, they should have a tight fitting door on each side of the glass to prevent freezing. The room should be kept dark except when working in the storage.

To possess a high insulating value, the material must contain a large number of small air spaces per unit of volume, and it must remain dry. Unglazed tile, unprotected concrete, soft brick, wood or soft plaster are not efficient insulating materials unless they are treated to withstand moisture. Damp or green sawdust or shavings are undesirable as they are likely to heat, sometimes even causing spontaneous combustion. Either will decay rapidly and settle when subjected to moisture. Crushed cinders make an excellent material for use in walls, between floor joists or other places where insulation is needed. They do not decay, are fireproof, do not absorb moisture readily and settle very slightly if well packed. The cinders should be finely crushed so that they will pass through a one-half inch screen. Dead air spaces do not provide as much insulation as is the common opinion. Unless the long vertical air spaces between studs are broken by inserting cross pieces at frequent intervals, convection currents are likely to arise which serve as a means of conducting heat across the so-called (*To Page* 17)

ORCHARD HEATING is a PROFITABLE PRACTICE

A Commercial Fruit Grower Reports on His Experience with Oil Burning Heaters in Orchard Use. Some Practical Pointers Based on Successful Use.

By N. Y. YATES

Proprietor, Spring Brook Farm, Indiana

IF ONE will approach the subject of protecting fruit crops from frost damage, or as some prefer to call it "frost insurance," with an unprejudiced mind, he will learn that in actual practice the heating of orchards or truck gardens during a period of frost is a thoroughly tried, proved and practical method of assuring oneself of the results of the year's labor. The United States Department of Agriculture has issued some splendid bulletins on this subject. Their Bulletin No. 1096, by Floyd D. Young, is a very comprehensive treatment of the subject.

Kind of Heaters Used

Experience has proved to the satisfaction of many growers that the oil-burning type of heater can usually be relied upon for satisfactory, economical results. Ease of operation, ability to control volume of heat and rate of oil consumption are important factors which influence most growers in favor of the oil-burning heater.

With the ordinary spring frost, there is little likelihood of injury to deciduous trees; but blossoms, buds and small fruits often suffer quite severely. Under favorable conditions following such a freeze, apricots and peaches, and to a lesser extent, pears, will put out a second lot of blossoms. But the fruit set from the second blossoms, after the first bloom has been killed by frost, is almost invariably small, misshapen, and usually not worth picking.

Small Heaters Often Most Expensive

In the beginning, growers are apt to want the smallest heater they can buy. Yet, in the experience of the most successful users of orchard heaters, this does not prove to be real economy. The longer burning period of the larger heater makes it the better buy. It actually costs less for the results obtained.

For areas in which the frost hazard is limited to a few hours on occasional nights, the three-gallon heater is to be recommended. In most regions this three-gallon heater when once filled, will cover the season's requirements, since it may be lighted or extinguished at will. This is an important feature and minimizes the greatest cost of orchard heating—the labor of refueling and the waste of fuel that accompanies burning heaters that produce smoke or have to be burned after the danger is past.

In the early days of orchard heating growers asked merely for a cheap heater, often being satisfied with the so-called "lard pail" or smudge pot type. Today, with the experience of the last decade to guide him, the grower inquires into the heat-producing qualities of the heater, the cost of operation, and similar important and business-like angles; for it is not the first cost alone of the heaters that must be considered. A cheap smudge pot may cost less in the beginning, but before the season is over will have cost more for fuel and labor without affording adequate protection.

Success will be found in adequate equipment, the number of fires must be equal to the demands of the situation.

Most growers today regard their heater equipment as frost insurance, considering that this equipment of the proper kind will last at least 10 years. Thus the cost per year of the smokeless heaters, with complete combustion and draft regulation, is by far the most economical installation to make.

Handling Orchard Heaters

If orchard heating is to be practiced successfully, it must be handled with care and attention. Success will be found in adequate equipment, good judgment, attention to detail, and extreme vigilance. An inadequate number of fires to the acre may often be worse than none at all, as the cost of firing may have to be added to the loss of the crop.

Whenever the temperature approaches the danger point, the rate at which the temperature is falling should be closely watched. The heaters must be lighted before the danger point is reached.

With a little practice, it is often possible to tell with considerable accuracy by inspection of the fruit or blossoms when the danger point has been reached, regardless of the temperature. When small apples or pears commence to freeze, minute blisters will begin to form on the skin. By watching for the first appearance of these blisters on the fruit in the coldest part of the orchard, the firing can be done at exactly the right time; no fruit will be lost and no oil wasted. By carefully cutting the blossoms of deciduous fruit, it is generally possible to note when ice crystals first begin to form in them and thus regulate the beginning of firing.

Frost and Minimum Temperature Forecasts

General forecasts of frost for large areas are issued by the Weather Bureau during the growing season, and in certain rather small districts where protection against frost damage is practiced on a large scale, forecasts of the minimum temperature to be expected from night to night are issued. Fruit growers who have means of protecting their crops should arrange with the nearest Weather Bureau station to obtain forecasts of the kind available in their community.

Will Orchard Heating Pay?

The question of whether or not orchard heating will pay at a given location depends largely on the amount and quality of the fruit produced. The costs of protection are the same for a given orchard, whether the trees are young or old, and whether a heavy crop of fine quality fruit or a small crop of inferior fruit is produced. Therefore, quantity and quality production always must be considered when the question of installing heating equipment is taken up. The average prices received for the crops also must be considered.

After the heaters have been placed in the orchard and filled with fuel, the actual heating operations would appear to require very little thought or planning. Apparently, the only operation involved is the lighting of the heaters when the thermometer falls to the danger point. While the firing can be handled successfully by this simple plan, a knowledge of a few of the underlying principles of orchard heating will enable the fruit grower to protect his crop more intelligently, saving fuel and, in many cases, obtaining better results.

Some Underlying Principles

If the air were uniformly cold on a frosty night, up to a height of several hundred feet above the ground, it would be difficult, or impossible, to maintain a safe temperature in the orchard through orchard heating. The heated air and hot gases from the heaters would rise rapidly above the trees like smoke through a chimney, and be lost before they could be of much value in protecting the fruit. Fortunately, such a condition is practically never found during the seasons when crops are in danger.

(To Page Nineteen)

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Unless you have been buying Eveready Layerbilt "B" Batteries for your radio set, you still don't know how economical radio can be on the farm, how much entertainment, helpful instruction, and invaluable crop, market and weather report service you can get for a given amount spent for "B" batteries.

It is possible to pack more active materials inside an Eveready Layerbilt because it is built of *flat* cells. These pack together tightly, occupying all available space inside the battery case, and eliminating many soldered connections. The waste spaces between the cells of a cylindrical cell type of "B" battery are avoided. An Eveready Layerbilt is all battery. That is why it lasts so much longer. Next time you buy "B" batteries, get Eveready Layerbilts.

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RIGID INSPECTION MAINTAINS STRAWBERRY PRICES

By E. C. TOTTEN
Del-Mar-Va Eastern Shore Association

FEDERAL INSPECTION of strawberries at two of the principal shipping points on the Del-Mar-Va Peninsula during the 1928 season was the only bright spot in what proved to be one of the most generally discouraging strawberry seasons experienced in Delaware and the Eastern Shore of Maryland and Virginia counties in several years.

Local berry buyers at Marion Station, Md., rated as one of the largest strawberry shipping centers in the world, if not the largest, and at Pocomoke City, Md., were responsible for the introduction of federal inspection, and while there was no phenomenal return because of this, it is generally conceded that it resulted in a much higher grade of pack and naturally better prices for the grower. Leaders in the movement believe that the effect will result in a more widespread employment of federal inspection and that within the next two seasons it will spread to the extent of covering the majority of other shipping points in the Maryland and Virginia counties on the Eastern Shore and also in Delaware.

John A. Burroughs, who headed a group of 14 federal inspectors at Marion Station, when questioned relative to the findings of his staff at that point, said that very shortly after the shipping season opened, the growers seemed to realize the advantage of quality, and taken throughout, from 80 to 85 per cent of the berries sold at Marion Station were rated as U. S. No. 1 quality.

Local shippers at this point, including Messrs. G. P. Parsons, H. P. Tull, W. R. Whittington and John T. Handy, who were largely instrumental in installing this service, have expressed gratification at the outcome. They mention that the growers responded most favorably to the regulations which demanded a graded product and a good pack. They assert that the educational value of this inspection will be lasting and prove to be an asset to the strawberry growers in that section in the future. There were as many as 14 inspectors employed at this shipping point during the height of the shipping season.

A few figures illustrating the average price paid for the federal inspected berries as compared with those not inspected are offered. On the opening day, inspected Klondikes and Missionaries shipped from Marion Station brought from $3.50 to $4 in early sales and from $2.50 to $3.25 in late sales. The same varieties and also inspected at Pocomoke City, Md., ranged from $2.50 to $3.60, while the nearest approach to this price for the non-inspected berries was $3 to $3.50 at Berlin, Md. On the same date, inspected Premiers brought from $5 to $5.25 during early sales at Marion Station and from $3 to $3.50 for late sales, and at Pocomoke City the inspected Premiers sold from $2.25 to $3, which exceeded shipping prices for non-inspected berries at any other point on the Eastern Shore of Maryland or Virginia, although in Delaware higher quality berries brought prices practically equal to those received at Marion Station and Pocomoke City.

As evidence that the Del-Mar-Va Peninsula strawberry crop is of vital importance in the national strawberry deal, figures are offered for the 1928 season showing the following carlot shipments:

Eastern Shore of Maryland counties: Freight, 423 cars; express, 187 cars; boat, 25 cars; making a total of 635 cars.

Eastern Shore of Virginia counties: Freight, 106 cars; express, 28 cars; boat, 21 cars; making a total of 155 cars.

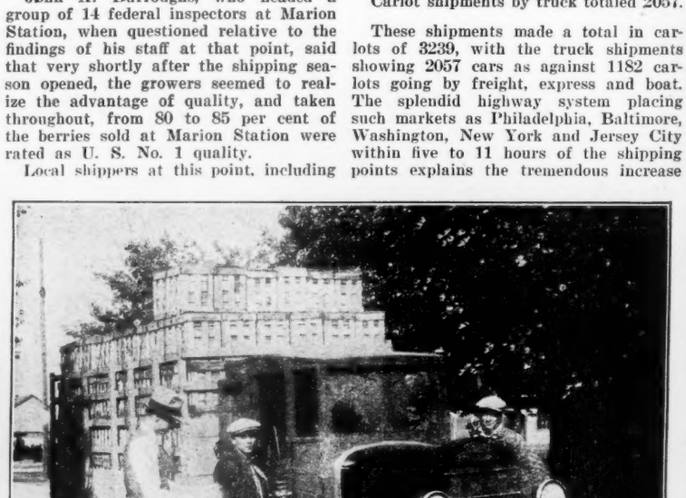
Delaware: Freight, 269 cars; express, 123 cars; making a total of 392 cars.

Carlot shipments by truck totaled 2057.

These shipments made a total in carlots of 3239, with the truck shipments showing 2057 cars as against 1182 carlots going by freight, express and boat. The splendid highway system placing such markets as Philadelphia, Baltimore, Washington, New York and Jersey City within five to 11 hours of the shipping points explains the tremendous increase in this method of transportation.

Del-Mar-Va Peninsula strawberries reached a total of 84 individual community destinations, representing 15 states and two Provinces in Canada.

The 1928 prices throughout the season were lower by a material extent than those in recent seasons, due almost entirely to the poor quality of berries caused by cool, wet weather during the growing period and also in a decided degree to the red spider plague which appeared especially in the Virginia and Maryland growing sections.



Federal inspection of strawberries on the "Del-Mar-Va" Peninsula

Start Next Season's Beekeeping Plans Now

IT WILL BE well for the amateur beekeepers and those who are planning to make their first start this spring, to begin their preparations at once.

If you do not have beekeeping literature, write to your state experiment station, or to the United States Bee Laboratory, Washington, D. C., and ask them for copies of their latest bulletins on the subject of beekeeping.

Arrangements will need to be made for securing your bees, and if you are unable to secure bees from a local beekeeper, it will be necessary for you to buy packages from a queen breeder in the South and have them shipped to you in the spring. You will also need to get your equipment together, consisting of hives, wired frames, or honey boxes, with foundation. You will also need to improvise some kind of feeding boxes with which to feed your package bees when they arrive, and maybe your full colonies if they are short of stores. Beekeeping supplies can be secured from a local hardware store or feed store.

If you are a beginner, you will also find it profitable to subscribe for an up-to-date bee journal.

How Birds Aid the Berry Grower

By JOHN B. BEHRENDS

THE BERRY GROWER realizes the tremendous loss that insects are capable of inflicting and has combated their increase in a number of ways, but in his warfare on these destructive pests he has scarcely taken into consideration the wonderful assistance given him the year round by the little feathered creatures of the air. If birds are present in sufficient numbers they will prevent the excessive increase of any kind of a pest which they will eat, and the number of birds required to accomplish this highly desirable end need not be very large in comparison with the number of insects; for each bird can devour an incredible number of insects, and the young birds in the nest require more of this food, in proportion to their size, than do their parents. They also eat many seeds that would otherwise rob the berry bushes of sunshine and moisture.

The Crow a Beneficial Friend

The familiar black crow that is condemned by many farmers because of pulling up sprouting corn, killing song birds, eating eggs, and other misdemeanors, is nevertheless a beneficial friend of the fruit grower. Insects comprise about one-fifth of its food. Grasshoppers, May beetles, and their larvae—the white grubs—caterpillars, weevils, and wireworms stand out prominently. In 1103 stomachs examined, these destructive pests comprised over 80 per cent of the insect food. The grasshoppers that eat the tender leaves of bushes and strawberry plants are naturally taken in greatest abundance late in the season. In September, they form about one-fifth of the total food. May beetles and white grubs that feed on the roots of plants and bushes are taken in every month except January, but occur most prominently in May. In June caterpillars are a favorite food, and weevils of various kinds are taken in varying quantities throughout the summer and fall. Numerous other beetles, wasps, and bugs are also eaten. Single stomachs containing upwards of 50 grasshoppers are not uncommon, so the fruit grower may know that he is a friend indeed.

The Wilson thrush or veery obtains most of its food from or near the ground. Ants, ground beetles, curculios and grasshoppers are favorites. It trips in among the bushes in the early morning in search of cutworms, beetles, and earthworms, and now and then picks off a hairy caterpillar of the gypsy moth. In the summer and fall it eats wild fruit, but seldom troubles cultivated varieties. The shy wood thrush destroys many insect pests in among the wild blackberries, strawberries and gooseberries. Examination of 22 specimens of this thrush taken from April to September showed that 71 per cent of their food consisted of insects, 20 per cent of fruit, and a small percentage of mullusks and spiders, together with a large proportion of myriapods. The wood thrush takes its food from the ground, shrubbery, and trees, and sometimes takes angle worms from the ground like the robin. It eats injurious grasshoppers and crickets, also ground beetles and their larvae, click beetles, wireworms and other insects that live in the shrubbery and on the ground. It rids orchards and gardens of cutworms, and is particularly fond of ants. It also does good service in killing some of the most destructive caterpillar pests, not neglecting the hairy species, like the forest tent caterpillar, and the larvae of the gypsy moth and the brown-tail moth, as well as most of the hairless species, such as both the fall and spring cankerworms. It also destroys the rose beetle, and stomachs have been found crammed with them.

Plant Lice Eggs Devoured by Chickadee

The chickadee probably ranks first among the useful birds from the standpoint of the small fruit grower. Much of the daylight life of the chickadee is spent in a busy, active search for insects and their eggs. This is particularly the case in winter.

The destruction of the myriad eggs of plant lice which infest the berry bushes is probably the most important service which the chickadee renders during its winter residence. More than 450 eggs are sometimes eaten by one bird in a single day. This prying bird eats many of the most injurious insects that might escape the observation of larger birds.

The brown thrasher is a familiar bird of the orchard and garden. An examination of the stomachs of 121 thrashers revealed that 64 per cent of the food eaten was animal matter and 36 per cent was vegetable. Half of the insects were beetles, while the remaining animal food was chiefly grasshoppers, caterpillars, bugs and spiders. While it eats a great deal of fruit of all kinds, it destroys many of the bugs that eat berries. Spending much of its time feeding on the

(To Page Eighteen)

The Market Review

By PAUL FROEHLICH
United States Bureau of Agricultural Economics

BY EARLY December, carlot movement of the important fruits and vegetables had dropped to about normal volume for this time of the year and was only half as heavy as during the preceding month. The recent average of daily shipments has been around 2000 cars, mostly apples, citrus fruits and potatoes. All kinds of fruit were moving in heavier volume than a year ago. Cold-storage holdings of apples were at their peak on December 1.

Grape output was rapidly catching up with last season's total, as December opened with a record of 79,000 cars to date and weekly shipments were still twice those of the same time in 1927. California had shipped more than 70,000 cars of grapes. With respect to prices, nearly all products except potatoes maintained a fairly strong position, and a few lines showed consistent advances with the progress of the season.

Apples Slowly Advancing

The general price level of apples in terminal markets and in producing sections was slightly higher than during previous months. By mid-November, the estimated farm price per bushel averaged $1.08, compared with 99 cents in October, 97 cents in September, $1.42 in November of last season and 85 cents per bushel two years ago. Barrels averaged $3.09 in mid-November for the United States as a whole, according to reports from a large number of growers. The year before, a level of $4.12 prevailed, and in late 1926 the farm price was $2.53. Bushel quotations were lowest in regions of heaviest production—the South Atlantic states and western states, where November averages were 91 and 94 cents respectively. Highest average of $1.31 was reported in North Atlantic states. Virginia, West Virginia, Colorado, Utah, Idaho, Washington and Oregon had lower price levels than any other states—only 80 to 90 cents per bushel. Western farm values had declined slightly from those of September, while the Virginia area showed a 10 cent advance.

A Glance Across Country

Starting in Maine, it is observed that the apple crop is lighter than last year, the fruit of rather small size, and quality generally poor. These conditions prevail throughout New England as a whole; graded stock is scarce, and considerable quantities of Virginia apples have appeared on the Boston market. New York has a much heavier crop than last season, but the standard winter varieties are not so plentiful as usual. The fruit is mostly of medium size and in good condition. The Pennsylvania apple crop was harvested early; storage houses are well filled, because shipments to date have been limited, and considerable western boxed fruit is stored in Pennsylvania. The bushel basket is gaining in popularity each year as a container for Pennsylvania apples. Reports from Delaware were uniformly favorable; the small quantity of fruit which remains in that state seems to be keeping well. In the Potomac Valley, apples were picked early and the autumn shipments were exceptionally heavy. Sizes were larger than desired, especially for export trade; quality was only fair, and a large volume of fruit went to by-products factories. West Virginia had a lighter crop than last year, with York Imperials particularly short. Bulk stock moved slowly until late October. Canning and vinegar factories were busy.

The Ohio apple crop varied considerably in different parts of the state, largely because of weather conditions. Baldwins were a short crop in northern Ohio. Apples in many Ohio orchards suffered damage from Brook's fruit spot. Serious dropping of fruit also occurred in early October. Southern Illinois not only had a heavy crop of fine quality, but the fruit was mostly of larger size than usual and a wider distribution is being effected each year. Michigan had a heavier total crop than in 1927, but winter varieties were light. Quantity was only average. Some of the popular varieties of apples in Arkansas and Missouri were short this season, but drying plants and vinegar factories were reported to be active. Northeastern Kansas had only a light crop, because of the spring freeze. There was some dissatisfaction with the color of fruit, but quality generally was good.

Though Utah's production is greater than in 1927, shipments are not expected to equal those of last season, on account of fruit being smaller in size. The percentage of Extra Fancy grade is rather low. Idaho's apple crop is mostly shipped; what remains in storage is apparently keeping well. Washington apples sized better than at first expected, though a few varieties ran heavily to smaller sizes. This has resulted in a price premium for larger sizes. Jonathans were marketed earlier than usual, as a result of a special advertising campaign. There was a tendency to pick apples at a proper stage of maturity rather than wait for high color, and, as a consequence, the pack of Extra Fancy fruit is decreased, while Fancy is increased. There has been heavy culling of the large crop of Washington apples. Shipping point prices generally are 50 cents to $1 per box below those of 1927. Most growers were holding Winesaps for the later market. California reports a very heavy crop, and the market has been dull. The Gravenstein season was in general unsatisfactory. Size of the late varieties is rather small, and prices show little fluctuation. A complete summary on "Apples in 1928" may be had from the Bureau of Agricultural Economics.

City Trading Moderate

City sales of apples were not very brisk, but demand may improve after the first of the year. Rhode Island Greenings and Wealthys from New York state had declined in New York City, while other apples and other markets were generally firm to higher. Best New York Wealthys, Twenty Ounce, and Baldwins, together with the larger-sized Virginia Yorks, ranged $4.50-$5 in the metropolis. Greenings sold as high as $6 per barrel, with McIntosh around $10. The range on bushel baskets in New York City was $1.50-$2.25. Western New York shipping points quoted Greenings from cold storage at $5.25-$5.50, and Baldwins brought $4.75, compared with $6.50 a year ago. Smaller-sized Ben Davis ruled $3.75-$4 at loading stations. According to variety, condition and source, barreled fruit was jobbing higher in Chicago at $4.50-$7. Extra Fancy northwestern boxed apples sold on that market at $2-$3.50, depending on variety. In early December last season, the Chicago price of boxes was $3-$4.50. Extra Fancy, medium to large-sized Jonathans had advanced to a range of $1.40-$1.50 per box at Washington shipping points; Winesaps sold at $1.50-$1.75, and Delicious at $2.25-$2.35.

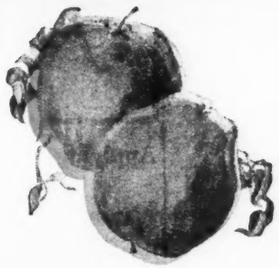
Shipments Decreasing

Movement of eastern apples during early December was still running ahead of the corresponding weekly figures for last season, but western shipments had fallen below the December record of 1927. Not only is the commercial crop almost equally divided this year between eastern and western areas, but carlot movement also is well balanced. About 44,500 cars had been forwarded from the West by December 1, and 46,000 cars from states east of Colorado. Each area was about 10,000 cars ahead of its corresponding record for 1927. More cars of apples have already been shipped this season than during all of the 1927-28 season, but the weekly output had decreased by December to 2500 cars.

Holdings at Peak

Cold storage holdings of apples usually are at their highest mark in December. On December 1, commercial cold storage houses reported 2,895,000 barrels, 16,930,000 boxes and 5,044,000 bushel baskets of apples on hand. Total holdings under

(*To Page* 21)



More "extra fancies"

Spray with S-W Dry Lime Sulfur

Lay your plans *now* for late winter and early spring sprays. Sherwin-Williams Dry Lime Sulfur will protect your trees from apple scab, pear scab, peach leaf curl, and cherry leaf spot . . . will control San Jose scale.

Use this modern, improved spray, *throughout the entire growing season!*

Apple growers using *only* S-W Dry Lime Sulfur last year marketed high percentages of "extra fancy" grade . . . glossy apples of better color *with no russet.*

They recommend this dry, powdered spray because it is the *safest* spray. Yet it *insures maximum efficiency.* It spreads evenly and stays active on the tree for a longer period. Simple directions on the package make it easy to use.

S-W Dry Lime Sulfur retains its strength through seasons and climatic changes . . . is *always uniform* . . . ready for use . . . does not freeze nor leak.

Economy in handling and hauling this convenient powdered form is another important factor in keeping growing costs low. It is quickly mixed, sprays without trouble and leaves no "empties" to return.

See your local Sherwin-Williams dealer without delay. Get his advice on your spraying needs. Plan *now* to get "top-price" for your apples this year.

Write for our booklet on Dry Lime Sulfur—it is free.

THE SHERWIN-WILLIAMS CO.
Dept. 703, 601 Canal Road N. W., CLEVELAND, OHIO

Frame C. Brown, prominent grower of Worthington, Ohio

Frame C. Brown of 100 Acre Fruit Farm at Worthington, Ohio, writes:

"Since we have been using Sherwin-Williams Dry Lime Sulfur, and by the way, we have used the Dry Lime Sulfur in very diluted form, we have had clean fruit with no spray injury whatsoever.

"We will never go back to liquid lime sulfur . . ."

H. W. Allison of Shippensburg, Pa., says:

"I have gotten the finest results with S-W Dry Lime Sulfur that I have ever obtained since growing fruit. My apples will run 98% perfect. I have less than one-half of one per cent scab.

"Every pound of S-W Dry Lime Sulfur dissolves freely, giving no nozzle trouble . . . sprays perfectly . . . leaves no sediment."

C. H. Glover of Belle Plaine, Kansas, gets good control:

"We have found in our own orchard that we can absolutely control the scale with Sherwin-Williams Dry Lime Sulfur at twelve pounds to fifty gallons of water, where we failed to get control with the liquid at eleven."

W. A. Bayer, Lehighton, Pa., says:

"Dry Lime Sulfur has been used as a dormant and summer spray on our Beaver Run Orchards for the past five years with very satisfactory results. We like it.

"It is very effective in the control of scale and scab. Our orchards at the present time are clean.

"It gives less foliage burning and fruit russeting than commercial liquid lime sulfur and equally as good control."

Growers like Mulsoid-Sulfur for peaches

Peach growers are enthusiastic over Mulsoid-Sulfur, the S-W spray for peaches. Prevents brown rot and scab. Mixes easily and evenly with water.

SHERWIN-WILLIAMS
SPRAY MATERIALS

Fruit Farm Engineering

By E. W. LEHMANN

Applying Agricultural Engineering

LARGE SCALE farming occupied the major part of the program on farm machinery at a recent meeting of the American Society of Agricultural Engineers. There are several developments taking place, all of them looking toward more efficient use of labor and machinery.

Large scale farming such as is practiced in the wheat area of Montana is one example. During the last few years the number of wheat farms in the state have been reduced from 35,000 to 14,000; the average size of farm has doubled during this period. More power machinery is being used and less labor, which is resulting in economy in production and greater net income to the operator.

An interesting feature of the large scale farming is the high degree of specialization. The wheat farmers of the West are apparently specialists in the production of wheat, in the same sense as the fruit grower who specializes in apples. The necessity of a little different program on middle western and eastern farms, requiring a diversity of crops, tends to hamper the big farm idea. Specialization is not practiced to the same degree under such conditions. However, a fuller use of the labor on the farm throughout the year is made possible.

A system of supervised farming, as practiced in the Middle West, was discussed. Under this plan, a group of farms are supervised by one or more specialists, who make a careful study of the needs of the farm from a fertility standpoint, plan a system to follow, and see that the plan is carried out. Under this system, a farm owner can get careful supervision of his farm at a nominal cost. Monthly reports are made by the tenant and complete records are kept.

This is a type of service which many land owners can well afford to pay for. In addition to applying the latest ideas relative to the management of the soils and the crops that are grown, special attention is given to the efficient application of labor by the use of the most up-to-date equipment.

Grinding Feed on the Farm

GRINDING FEED on the farm is becoming an established practice on many farms with a saving that pays well for the investment and the labor required. Many fruit growers could well afford to invest in a small feed mill to grind feed for the poultry and a few cows.

Much experimental work has been carried on by the various agricultural experiment stations on the value of different feeds. As a result of this work, rations have been developed for different classes of livestock, which result in the greatest efficiency and economy in production. The great value to the farmer is that these feeding rations may be mixed at home, using for the most part the grain grown on the farm.

The value of an investment in feed grinding equipment can be measured only by the saving and net return to the owner. Many farmers are afraid to invest in new machines and as a result their operations are reduced or their expense is increased. In some cases, it may result in a poor quality of product. This is certainly true with the fruit grower who does without adequate spray equipment.

I visited a farm recently where the owner had installed an electrically driven feed mill which cost him over $300. The mill was purchased for use in preparing feed, principally for laying hens. This farmer was preparing laying mash in accordance with the recommendation of the agricultural experiment station at a saving of a dollar for each 100 pounds fed. The actual saving over the price of feed in town amounted to a dollar a day. In addition to this, he prepared, at considerable saving, feed for a few dairy cows.

Where a farmer broods even a few hundred baby chicks, he can well afford to provide a small mill for this purpose alone. Small electric operated or hand operated mills may be used for this purpose. However, a hand operated mill would result in a labor charge against the feed that could hardly be justified, unless there is a lot of labor available.

During the last few years, rather inexpensive, small size hammer mills have been developed. These mills are very satisfactory for grinding shelled corn and other small grain. Such small mills are not suitable for grinding ear corn. A lot of people who feed livestock desire to grind the entire ear. However, when adequate roughages are available, the ground cob is of little value.

In a discussion on feed grinding at Chicago recently, a young man from Missouri brought out the fact that they had developed a plan for handling ear corn with a small hammer mill used in combination with a corn sheller, the sheller and the mill both being operated off the same pulley, with one belt on the outside of the other. I think most people will agree that there is very little nutritive value in corn cobs, and there is not much reason for having the cobs for bulk only. With the scheme suggested, it was possible to grind with considerably less electric energy consumption per bushel and also to increase the capacity of the mill very materially, of course eliminating the cobs.

Such an outfit, sheller and mill, could be operated by a two horsepower motor. All the feed needed on the average farm, where a few cows and considerable poultry are kept, could be ground with this outfit with a minimum expense, and at quite a saving over the price of most commercial feeds.

Better Lighting on Farms

THE NEED of better lighting is probably the most important factor which prompts people to get electric service on the farm. To be without it, after a person has enjoyed good lighting, is a real hardship. There is no place where good lighting is needed more than on the farm. Good lighting is given first place by most farm women in the list of major home improvements.

It should be kept in mind that a bare electric light does not give good illumination unless it is properly controlled. So the matter of location, the intensity of the lamp, and the kind of fixture must be considered. After all, the real measure of lighting is how it helps one to see.

Better lighting is needed about the farmstead, as well as in the farm home. Much of the farmer's time is spent in work in the morning and evening when natural lighting is not satisfactory. Few people really appreciate how much of the work on the farm is done after dark. Good yard lights and good lights in the barn and other buildings are worth much more than the cost of operation.

During recent years much has been printed about the value of lights in the poultry house for increasing egg production during the winter months. There is no question but that an increased length of working day for the hen will result in more eggs, if proper precaution is taken to see that adequate and proper feed is provided and other conditions are satisfactory.

It is generally agreed that electricity is the ideal energy for lighting, whether it be in the home, the barn, the fruit packing shed or the poultry house. It is free from the hazards of the open flame. It does not make the air impure by using up the oxygen present, nor does it give off poisonous gases of combustion. It is economical to operate; the actual cost for lighting all the farm buildings would be only a few cents a day. It is convenient and easily controlled from a distance. A yard light may be easily controlled from the house and would serve

as a form of protection at night. Finally, a unit may be selected with capacity for providing proper lighting for any situation.

The general tendency is toward more illumination. This is true for the school, the store, the factory, the shop and the house. Adequate lights result in added efficiency. The farmers should not overlook this need in planning for this year's improvements.

Some Home Heating Problems

A FARMER'S WIFE, in telling me of their heating problem, stated that they had a large two-story house heated with a hot water system. At present there is only herself and her husband at home, and they will not use the upstairs rooms this winter. It can be readily seen that a single room or a part of the house cannot be shut off when it is heated with hot water, due to the danger of the water freezing. It is possible that the pipes leading to the second story can be disconnected and that part of the house closed off from the balance. This is a problem than can only be solved by investigating local conditions.

Another farmer advised that he wished to install a modern heating plant but did not have a basement in his house. This difficulty can be overcome by the installation of a hot water system, the type where the boiler is placed on the first floor. The boiler has the appearance of a large radiator and can be located in any room to be heated and the radiators placed in the other rooms.

The old house that has a basement can have a "pipeless" or "one pipe" furnace installed at relatively little expense. This type of warm air furnace has come into favor during the last few years, and is giving good satisfaction where its limitations are recognized, when it is installed. A steam plant is also easily installed in an old house that is provided with a basement.

Small Fruits for Summer Income

(*From Page Three*)

important part in the home market for small fruits, it should not be considered the only outlet for these crops. There are many communities in which there are no canneries, yet these places often have home markets which may be as profitable or even more profitable than the cannery. In most fruit producing sections there are large consuming centers within driving distance of the farm, which may be considered the home market, where a succession of crops, beginning with strawberries and ending with apples, grapes and pears, may be sold to advantage.

There are certain hazards in serving the fresh fruit markets which do not appeal to many growers and if they are fortunate enough to be near a canning factory, their marketing problems now and in the future should be the least of their worries. The cannery promises to become a more important factor in horticulture. The automobile is weaning the modern housewife away from the kitchen and she is doing less home canning. She has found that she can buy most fruits in the tins for less money than she can purchase the raw products and pack them herself over a broiling stove in a sweltering kitchen in midsummer. Then, too, state and federal inspection of canneries and canned foods has given the housewife a greater degree of confidence in all canned products.

Despite the rapid development of the commercial canning industry in recent years, there always will be a fresh fruit market for all small fruits. Truckers are bringing that market to the farmer's door.

Growth of the trucking business is one of the most remarkable developments of the last decade and the fruit growers have benefited more from the trucker's operations than any other class of farmers. There is every reason to believe further expansion of the trucking business will take place as highways are improved, further enhancing the position of the farmer who is growing small fruits for summer profits.

Read the advertisements—those guide posts to better things

Success with the Strawberry

(*From Page Four*)

munity, the matter of selecting the variety to grow is predetermined by growers already in the business. Straight cars are always to be preferred to mixed cars. As a result, certain varieties predominate in certain sections of the country. Florida is the home of the Missionary. Florida, Texas, Louisiana, Arkansas and the other cotton states produce the Klondyke, which, by the way, originated in Louisiana. Still further north in the Ozarks, Tennessee and Kentucky, we come into the territory of the Aroma. As we cross the Ohio and local markets absorb a larger proportion of the crop, we find dominance of a single variety or two. A decade ago the leading varieties were the Senator Dunlap and Gandy, but at the present such varieties as Joe, Sample, Premier, Chesapeake and William Belt are largely grown. The Dunlap, a native of Illinois, probably still holds the lead through the prairie states, and the Gandy is still preferred on the heavier soil.

This implies a varietal preference for certain soil types. Probably the above illustrations are as marked as any. Some varieties, like the Chesapeake or Gandy, seem to do well on only one type of soil, while others, like the Premier, are rather cosmopolitan, succeeding almost anywhere they are placed.

Whether a variety is perfect or imperfect is not nearly so important to the grower as is its behavior under his soil conditions. There is some evidence that pollen production is a devitalizing process; hence, pistillate varieties should have much more energy to devote to the production of fruit than those varieties which must also produce pollen. From records of the variety test plots at the Ohio Experimental Station, one is led to believe that the imperfect varieties as a class are more productive and are less subject to frost injury than are the staminate or perfect varieties. The records, however, show that there is much greater variation between varieties of each class than between the averages of the two groups. One eminent horticultural authority has held the opinion that on account of the increased vigor and hardiness of imperfect varieties, future development of the strawberry industry lies in the development of such varieties, of course, together with high yielding perfect varieties for pollination. Another authority holds that because many of our high yielding sorts are perfect and because with the perfect sort there is no pollination problem, the time will soon come when we will grow only perfect varieties.

The practical concern of the grower is not so much as to the trend toward perfect or imperfect sorts. What he wants is the variety which combines vigor, productiveness, resistance to disease and insects, and good fruit characters. If the varieties he selects chance to be imperfect, every third or fourth row should be set to a perfect variety, having as nearly as possible the same qualifications. In selecting a pollinizer, it is well to remember that there are some semi-perfect varieties, such as Glen Mary and Premier. These usually produce sufficient pollen to fertilize their own blossoms, but, though classed as perfect, they do not produce sufficient pollen to warrant their use as pollinizers.

Since the dormancy of the strawberry plant is not so complete as that of fruit trees, its shipment is attended with greater risk. For this reason, other things being equal, home grown plants are best, and wise is the man who anticipates his needs and plants an extra row to furnish him plants the succeeding spring. This does not mean that strawberry plants, when well packed, cannot be shipped a considerable distance with safety. In securing plants from a distance, it is always safer to order from about the same latitude or else further south. Plants from further south will naturally be received before planting time, but the bundles can be opened and the plants heeled in until the ground is fitted for them. When plants are ordered from too far north, they are apt not to arrive until after the proper planting season.

V. Properly Fit the Soil

Extra labor spent in better fitting the soil for any crop is usually profitable, and this is especially true in the case of strawberries. Plowing may be done in the spring or fall. If the soil is plowed in the spring, it is essential that it be well worked down. The use of a roller or culti-packer in firming the soil is usually advisable. The surface should be level, smooth and fine. If the soil is worked when in the proper condition for working (not too wet) it is difficult to get it too firm.

VI. Plant Carefully

While there have been many plans and systems used in strawberry culture, the matted row system with the rows three and a half to four feet apart and the plants from one to two feet apart in the row, is the one most generally used in commercial strawberry growing sections. The distance to set the parent plants apart in the row depends upon the ability of the variety as a plant maker. With a variety like the Chesapeake, which makes comparatively few plants even under favorable conditions, 12 to 15 inches is plenty far enough apart, while a variety like Warfield or Senator Dunlap, given good conditions, will make plenty of new plants if set two feet apart.

There are almost as many methods of setting the plants as there are growers. Some prefer to use a dibble, some a hoe and some a spade. The last named method is illustrated in the accompanying cuts. The plant setter used for transplanting cabbage and tomato plants is sometimes used, and where sufficient care is exercised, it is satisfactory. The essential things in planting are the removal of all the leaves but two, together with any flower buds, trimming the tip ends of the roots so as to make setting easier, seeing to it that the crown of the plant is not *near* but *at* the surface of the ground and firming the dirt about the roots. While not essential, it is quite beneficial to smooth the ground about the plants with an iron garden rake immediately after setting. This levels off the soil, breaks any crust and may well take the place of the first cultivation.

VII. Secure as Large and Vigorous a Stand of Plants as Possible Before Winter

In the main, the strawberry crop is produced the year before it is harvested. Weather and other conditions in the spring preceding and during the harvest season have some effect upon the crop, but the flower buds are differentiated and the plant food stored up the fall before. Thorough regular cultivation, preferably with a fine toothed cultivator so as to waste as little of the moisture as possible, is essential to keep the plants growing during the summer. Whether to remove the first runners or not is a debatable question. If one knew whether the fall would be favorable for runner production or not, he would know whether to destroy the first runners or save them all. Of course the blossoms should be kept off the newly set plants.

VIII. Destroy All Excess Runner Plants

These are weeds in as true a sense as are any other plants which rob the future berry producers of sunlight, food and moisture. I know of one grower who took a spiketooth harrow and went over his berry patch, tearing out literally bushels of plants. I am not recommending this practice, but do urge that as soon as the row is filled with plants four to eight inches apart each way the rest of the runners be considered as weeds and treated accordingly. A runner plant which strikes root in an already well filled row and throws up a couple of leaves and a weak spray of berries, chiefly nubbins, does so at the expense of the other plants about it and the row is much better off for its absence.

IX. Mulch for Winter Protection

The proper use of mulch, to protect the plants against the drying winds of winter and the alternate freezing and thawing of the soil, will pay year in and

year out. This is applied in November or December after the ground is frozen. The list of materials which may be used is a long one. Where clean wheat straw can be obtained, there is probably nothing better, although straw with weed or grass seed in it is far worse than no mulch at all. Rye straw and cornstalks are too coarse to be satisfactory. The mulch is put on to a depth of three or four inches, completely covering the plants. In the spring when the plants start to grow most of the mulch is removed to the aisles between the rows, where it helps conserve the moisture and keeps the pickers out of the mud in wet weather. Marsh hay, planer shavings, pine needles, leaves and other material are sometimes used for mulching and serve the purpose fairly well, but they are inferior to clean wheat straw.

X. Pick, Pack, and Handle So as to Produce an Attractive Product

Strawberries should be picked by pinching off the stem one-half inch from the hull and not by pulling from the plants. They should be put without bruising in clean boxes and taken as soon as possible into the shade. Picking when wet is to be avoided. Grading the berries—that is, keeping the small and misshapen berries by themselves—pays in strawberry marketing the same as it does for other fruits.

Coming Horticultural Society Meetings

ANNUAL MEETING Peninsula Horticultural Society, Camden, Del., January 29-31, 1929. Secretary, J. F. Adams, Box 425, Newark, Del.

Annual meeting Maryland State Horticultural Society, Hotel Rennert, Baltimore, January 8-10, Secretary, G. Rust Canby, Silver Springs.

Annual meeting and apple show Massachusetts Fruit Growers' Association, Worcester, January 8-10. Secretary, William R. Cole, Amherst.

Annual winter meeting Missouri State Horticultural Society, Missouri Hotel, Jefferson City, January 30-31. Secretary, Patterson Bain, Jr., Columbia.

Annual meeting Ozark Fruit Growers' Association, Monett, Mo., January 8-9. Secretary, Charles Carmichael, Monett, Mo.

Annual meeting Nebraska State Horticultural Society, College of Agriculture, Lincoln, January 8-10. Secretary, E. H. Hoppert, College of Agriculture, Lincoln.

Seventy-fourth annual meeting and exhibit New York State Horticultural Society, Rochester, January 16-18. Secretary, Roy P. McPherson, Le Roy, N. Y.

Annual meeting American Pomological Society, Edgerton Park, Rochester, N. Y., January 15-18. Secretary, H. C. C. Miles, Milford, Conn.

Eastern meeting New York State Horticultural Society, Poughkeepsie, January 30-February 1. Secretary, Roy P. McPherson, Le Roy.

Winter meeting Ohio State Horticultural Society, Horticultural Building, Ohio State University, Columbus, February 4-7, in connection with annual Farmers' Week meetings. Secretary, F. H. Beach, Columbus.

Annual meeting Pennsylvania State Horticultural Association, Harrisburg, January 22-24. Secretary, S. W. Fletcher, State College.

Annual meeting Rhode Island Fruit Growers' Association, Providence, January 11. Secretary, Richard M. Bowen, Apponaug.

Thirty-ninth annual meeting South Dakota State Horticultural Society, Watertown, January 8-10. Secretary, N. E. Hansen, Brookings.

Annual meeting Tennessee State Horticultural Society, Hotel Hermitage, Nashville, January 16-17. Apple show to be held in connection with meeting. Secretary, G. M. Bentley, Knoxville.

Annual meeting Tennessee State Beekeepers' Association, Hotel Hermitage, Nashville, January 18. Secretary, G. M. Bentley, Knoxville.

American Honey Producers' League, Sioux City, Ia., February 7-9. For detailed information write to J. V. Ormond, Little Rock, Ark.

Fruit Farm Poultry

By RALSTON R. HANNAS

Getting Eggs in January

WINTER EGGS are more profitable than spring eggs, providing a good production is obtained, as the prices at this time are higher than in the spring. If birds have been grown and fed properly, it should not be a difficult proposition to get eggs now. Comfortable houses and good feed are two important items in getting eggs.

The modern ration for laying birds is divided into two parts: a soft feed, or mash, that is kept before the layers all the time in hoppers so they can help themselves at will, and a hard feed, or grains, otherwise called a scratch feed, because it is usually fed in the litter night and morning to make the hens scratch for it. A good grain ration is one composed of two parts of corn and one of wheat, and is fed during the winter at the rate of from 14 to 15 pounds per 100 birds per day. The laying mashes as put out by the reliable feed companies are good mashes and are well balanced. If desired, a home mixture may be made as follows: equal parts of bran, middlings, corn meal, ground oats and meat scrap. Grit and crushed oyster shells should be kept before the layers all the time.

The grain part of the ration is the part that keeps the hens in good condition of flesh, while the mash part is the part that goes into the making of eggs. So it is necessary to get a good consumption of the mash. If birds don't eat the mash for some reason or other, something must be done to encourage them to. One thing that will help is to put another mash hopper in the pen to make sure that all birds will have a chance at the feed. Allow about one foot of hopper space to every four hens.

Another thing that will help is to feed a wet mash once a day, about as much as will be cleaned up by the layers in about 20 minutes. The regular laying mash can be used and moistened with skim milk. This will act as a sort of an appetizer, and will encourage the further consumption of the dry mash. In fact, milk alone in addition to the regular dry mash will help to get more eggs. If milk is not available, an extra amount of meat scraps may be put in the mash until production is started, say about three pounds in every 100 of the mash. After production has gotten a start, this may be reduced gradually to the former amount. A tonic is sometimes good just at this time, if the birds are in good condition and look as though they should be laying but are not. It seems to give them a start they need. A tonic may be given for about 10 days or two weeks.

One thing that will help considerably is to keep the layers confined to the laying house instead of letting them run out whenever they want to. The cold winter weather, which is quite changeable in some sections, plays havoc with production if birds are confined for a few days, then let outside. The best thing is to let them stay indoors all winter. With breeders, however, this is different, for it is not a matter of the number of eggs so much as it is fertile eggs containing good, strong germs that will hatch.

To Make the House Warmer

MANY poultry houses contain too much air space; they may be too high in front or to high in the rear or in the middle. The result is that there is more overhead space for the birds to warm up with their body heat than there would be in a house that was not so high. The house is too cold.

Such houses can easily be fixed so there will be less space for the hens to warm up. Simply by putting what is called a straw loft in the house will work wonders in this respect. If, for example, the house is a gable roof house or a semi-monitor house, the air space in the peak is cut off from the rest of the house by placing one by four-inch boards edgewise directly below every other rafter at a height of six and one-half or seven feet. These run from front to rear, and on top of these are laid one by four-inch boards four inches apart, running lengthwise of the house. On top of these is packed from eight to ten inches of straw. If there is some sort of opening in the gable or upper part of the house, above the straw, there will be a circulation of air from the windows in the house. This straw loft makes the house much warmer and at the same time provides for some ventilation.

Looking Ahead

JANUARY is the "looking ahead" month. It is the first month of the year and we generally think ahead and look ahead at our year's work. The poultry flock may be only a sideline, but if it is worth while giving it a little attention as far as planning is concerned, for a better flock will result as well as a more profitable one.

Since eggs are the largest part of the poultry income, as a rule, our endeavor should be to get more eggs per bird than we got last year. Getting eggs is not a matter of feeding alone at the time we want the eggs. It goes back farther than that. Of course, breeding enters in here and is of prime importance, for unless the ability to lay is bred into the flock, it will be a hard job to get eggs out of them. Let's take it for granted, however, that this ability to lay is bred into the flock, whether we hatch our own chicks or whether we buy our chicks from a hatchery or breeder. Egg production goes back still farther than feeding at the season the eggs are wanted.

It goes back to hatching time. It makes a big difference just when the pullets mature as to when the eggs are produced and how many are produced. It takes from five to six months for Leghorns to mature and about a month longer for the heavier breeds. Figure this out, therefore, when deciding to buy your baby chicks or to hatch your chicks. Decide the date you want your pullets to start laying and figure back the necessary length of time. It must also be taken into consideration that eggs in late summer and fall make the most money for the poultry keeper.

It must also be remembered that it does not pay, as a rule, to hatch chicks after the middle of May, unless the location is in the northern part of the country where the spring season is always late, for late hatched poultry in the central and southern part of the country does not make the growth that earlier hatched poultry does. These things must be considered in starting the season's hatching and brooding.

Accommodations to Fit the Flock

POULTRY has been a profitable sideline on many farms in the last few years. Farmers have realized this and in many cases have acted accordingly by keeping more chickens and feeding them to get more eggs. Unfortunately, many have not recognized the fact that their former equipment that was satisfactory for the smaller number of chickens does not meet the needs of their increased flocks.

This trouble can be corrected to a large extent on many farms by providing further housing, brooding and rearing accommodations this year. This also means providing clean ground on which to brood and grow the young stock—by clean ground is meant ground on which poultry has not been raised for at least three years and on which no poultry manure has been put as top dressing for at least three years.

Now is the time, just a little while before the baby chick season, to make preparations for the new flock, so the health and vitality can be maintained and all the profit can be gotten out of the poultry that is there.

Constructing the Air Cooled Storage

(From Page Five)

"dead air" space. Corkboard is one of the most efficient insulating materials available but is quite expensive when first cost alone is considered.

Insulation is also available in the form of rigid fiber boards such as Celotex, Insulite, and other prepared materials. These materials usually are made from sugar cane or wood fibers pressed tightly together into the form of boards or sheets of considerable size, generally about one-half inch thick. Besides having efficient insulation properties, these fiber boards have considerable structural strength and when properly protected from moisture and rodents, they form practical building materials and may be secured at most lumber yards.

Large Air Intakes and Outlets Necessary

The temperature of an air-cooled storage is regulated primarily by ventilation, consequently ample provision must be made for moving large quantities of air through the building. The air intake openings must be large and numerous. Many storages have been constructed with too few and too small air inlets to make possible thorough ventilation.

In the cellar storage, the air inlet openings are usually made through the wall beneath a false floor on the exposed side. On the sides surrounded by soil, ducts are provided opening at the ground level and running down the outside of the wall to the floor level, where they enter through the wall beneath a slatted false floor. In above-ground buildings, a window-like opening is provided through the wall just above the ground. The openings should be rectangular and at least 18 by 24 inches. Enough such openings should be provided to furnish one square foot of intake opening for each 500 to 700 cubic feet of storage space. These openings are generally spaced at regular intervals about the building. All openings should be screened to exclude rodents and should be provided with tight fitting insulated doors.

The outlet flues must be of generous size and should lead directly from the ceiling of the storage to the peak of the roof where a ventilator cover or cowl is placed. The flues should have a diameter of at least 24 inches and may be either round or square. If made of wood, it is well to make them of double thickness of one inch material with heavy building paper between, keeping all cleats or braces on the outside. Their number should be such as to provide a total outlet opening equal to 60 to 65 per cent of the intake opening area. Doors or dampers for closing these flues must be included.

Electric fans or blowers are frequently used to increase the volume of air moved through the ventilating system. These may be used to force in the cold air or to exhaust the warm air.

The false floor usually is constructed about 18 inches above the ground floor and is made from two by two or two by four inch strips placed about one inch apart. The idea is to make possible the movement of air beneath the stored fruit and up through the stacks in all parts of the room. If it is remembered that the air will move from air intake to air outlet by the most direct and least obstructed route, the poorly ventilated locations for any particular storage may be easily determined.

The ideal construction of a storage house should be such that once the fruit is cooled down there will be very little change in temperature when the ventilating system is closed. This means that the building must be well insulated and that all doors, intake and outlet covers fit tightly and are of a sufficient thickness to prevent the transfer of heat. These points are a little more easily incorporated into an above-ground building than one of the cellar type. The cost of excavating, when a natural location is not available, is another item against the cellar storage. Additional insulation may raise the cost of the above-ground building to about the same level, and consequently these and other factors must be balanced against each other in determining which type of building to erect.

THE FRUIT FARM MARKET

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Write advertisement on separate sheet. Please enclose cash with order. For advertisements addressed in care of this publicaiton, allow 5 words for address.

SPECIAL NOTICE

All advertising copy, discontinuance orders or change of copy must reach this office by the 10th of this month for next issue.

Address

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53 West Jackson Boulevard, Chicago

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NEW INVENTION—400 PER CENT PROFIT. Liquid quick mend for fabrics and hosiery. Stops runs. Every woman buys. Hundred other fast sellers. J. E. Johnson Co., Dept. 4573, 6129 Wentworth, Chicago.

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MEN WANTED TO CANVASS FARMERS. $160 monthly and expenses. Opportunity for advancement. Bigler Co., J-2, Springfield, Ill.

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DOGS

COONHUNTER, TRY ONE of GEORGIA'S BEST four-year-old coonhounds, will trail and tree in icy water. Free trial allowed. D. D. Scott, D-116, Calhoun, Ga.

READY TO SELL MY REAL COONHOUND cheap on trial. I pay express. Jean Vaughn, D-19, Mayfield, Ky.

HUNTING HOUNDS, CHEAP. TRIAL. DIXIE Kennels, SC-26, Herrick, Ill.

FARMS AND ORCHARDS

FRUIT GROWING IN THE OZARK REGION of Southern Missouri and Northern Arkansas has a big advantage in having soil and climate ideally adapted to fruit and berry culture. The gentle slopes of the Ozarks with their fine grained clay soil, abundant rainfall, mild winters, early springs, make the Ozarks ideal for the fruit grower. The nearby cities of St. Louis, Kansas City and Memphis provide great markets. The healthful climate, pure mountain spring water, the fine spirit of co-operation, prosperous and growing communities, good schools and hard surfaced roads make a delightful homeland. Land can still be bought at reasonable prices that will insure good profits on grapes, strawberries, apples, small fruits and vegetables. Write for more facts. C. B. Michelson, Frisco Railway, 861 Frisco Bldg., St. Louis, Mo.

160-ACRE FRUIT FARM
90-ACRE FOUR-YEAR-OLD ORCHARD. BEST seller varieties apples and peaches; ideal condition, on State Highway 63 and Frisco railroad. Oregon county, Missouri, heart of the Ozark fruit section. Will sell all or part. Pioneer Trust Company, Kansas City, Mo.

IMPROVED FARMS FOR RENT IN MINNEsota, North Dakota, Montana, Idaho, Washington and Oregon. Make a trip and see the growing crops. Cheap round trip homeseeker's tickets. Write for free books. E. C. Leedy, Dept. 973, Great Northern Railway, St. Paul, Minn.

PRODUCTIVE 18-ACRE FRUIT FARM ON HARD road, $1600. E. McJilton, Mt. Carmel, Illinois.

FARMS WANTED

CASH FOR YOUR PROPERTY, FARM, BUSIness or residence. No matter where located. Free information. International Realty Co., Ford Bldg., Detroit.

WANTED—TO HEAR FROM OWNER OF LAND for sale. O. Hawley, Baldwin, Wis.

HELP AND INSTRUCTION

GOVERNMENT JOBS, $1260 TO $3400 YEAR. Men-women, 18-50. Steady work. Vacation. Many February examinations. Full particulars with sample coaching free. Write immediately—today. Franklin Institute, Dept. M-75, Rochester, N. Y.

HELP AND INSTRUCTION—FEMALE

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LIVE STOCK

CHOICE GUERNSEY OR HOLSTEIN CALVES, shipped subject to inspection. Edgewood Farms, Whitewater, Wis.

MISCELLANEOUS

FREE BOOK — ELIJAH COMING BEFORE Christ. Megiddo Association, Rochester, N. Y.

OLD MONEY WANTED—WILL PAY FIFTY dollars for nickel of 1913 with Liberty head (no Buffalo). We pay cash premiums for all rare coins. Send 4c, for large coin folder. May mean much profit to you. Numismatic Co., Dept. 546, Ft. Worth, Tex.

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MOTORCYCLE BARGAINS—USED, REBUILT. Guaranteed. Shipped on approval. Terms. Catalog free. Clymer, Denver, Colo.

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PEACH AND APPLE TREES, $5.00; $7.50 PER 100 and up. Complete assortment fruits, berries, vines, ornamental trees, vines, shrubs, evergreens. Catalog in colors free. Tennessee Nursery Company, Box 101, Cleveland, Tenn.

APPLE AND PEACH TREES, 5C AND UP; grapevines, 3c; best varieties. Catalog free of fruits, berries and ornamentals. Benton County Nursery, Box 500, Rogers, Ark.

100,000 DUNLAP AND AROMA STRAWBERRY plants. Also full line of nursery stock. Schroeder Nursery, Farina, Ill.

LATHAM RASPBERRY, DISEASE FREE. FROM Minnesota's cleanest fields. Catalog free. Daniels Nursery, Long Lake, Minn.

ORNAMENTALS

NEW EVERBLOOMING MOCK ORANGE. Angelus, the most fragrant and beautiful shrub for informal hedges yet produced. 12 plants, 2 ft., $15. Stanley Dodge, Ottawa, Kans.

PLANTS

TWO YEAR OLD GRAPE PLANTS LESS THAN 2c each. Mastodon, the world's largest everbearing strawberry, 18 fill quart. Bears July to winter and 3 crops in 18 months. Bring 30 to 50c quart. Alfred the 1¼-inch blackberry, coreless, sweet and hardy. Beautiful catalog free. Tells how to get 500 genuine Mastodon free. South Michigan Nursery (R. 1), New Buffalo, Michigan.

MILLIONS FROST-PROOF CABBAGE, CAULIflower, onion and other vegetable plants. Illustrated catalog every market gardener should have. Write today—it's free. Omega Plant Company, Omega, Ga.

100 MASTODON EVERBEARING, $1.85. OVER 300 plants, $1.50 per 100. Why pay more? Illustrated plant seed catalogue free. Edward Labke, New Buffalo, Mich.

PEACH AND APPLE TREES, $5.00 PER 100 and up. Fruits, ornamental trees, vines. Tennessee Nursery Co., Box 201, Cleveland, Tenn.

TYPEWRITERS

TYPEWRITERS—$10 UP. EASY PAYMENTS. Yotz Typewriter Co., Shawnee, Kansas.

POSITION WANTED

HORTICULTURIST—SPECIALIST ON APPLES. Wholesale only. Four years university training. Twenty years school of experience. Desires position as superintendent of commercial orchard. Unlimited reference. J. F. Cook, Fayetteville, Ark.

EXPERIENCED ORCHARD MAN WISHES POSITion on orchard or fruit farm—understand all branches of orcharding. Address Box 11, American Fruit Grower.

EQUIPMENT WANTED

WANTED—POWER SPRAYER. MEDIUM SIZE. Good condition. E. I. Ritzenthaler, Reedsburg, Wis.

TOBACCO

TOBACCO: SMOKING, 12 POUNDS, $1.40; chewing, 12, 1.90; 5c cigars, 50, $1.50; twist, 40, $2.40; plugs, 40, $2.40, 10c sizes; 5 pounds bag smoking, $2.40. Farmers League, Watervalley, Kentucky.

GOOD SMOKING TOBACCO, 10 POUNDS, $1.50; chewing, 10 pounds, $2.50. Send no money—pay when received. Pipe free. Albert Ford, Paducah, Kentucky.

HOW BIRDS AID the BERRY GROWER

(From Page Nine)

ground, the brown thrasher destroys crickets, grasshoppers, white grubs and May beetles. During June, snap beetles and curculios are destroyed in among the berry rows, and many caterpillars are also picked up from the ground. Cutworms, cankerworms and some gypsy moths are also consumed, but it is not usually fond of hairy caterpillars.

The lively northern yellowthroat with his "witchery" song renders the small fruit grower a valuable service by swallowing the abundant leaf hoppers that puncture holes through the leaves of the berry bushes and shrubs. It also flies long distances from its nest to capture grasshoppers and cankerworms for its hungry young. One of these lively little fellows was seen to eat 52 caterpillars of the gypsy moth in a few minutes. Case bearers, leaf rollers and many destructive caterpillars, butterflies and moths are also eagerly devoured.

Scarlet Tanager Very Useful

The scarlet tanager is both beautiful and useful. As a caterpillar hunter, the bird has few superiors, being especially destructive to the gypsy moth. Leaf-rolling caterpillars it skillfully takes from the rolled leaves, and it also digs out the larvae of gall insects from their hiding places. Wood-boring beetles, bark-boring beetles and weevils form a considerable portion of its food during the months when these insects can be found, and click beetles, leaf-eating beetles, and crane flies are also greedily swallowed. When the fruit orchards are being cultivated in the spring the tanagers follow the cultivator like the robins and blackbirds, picking up earthworms, grubs, ants and ground beetles. Grasshoppers, locusts and a few bugs are also taken from the ground, grass and shrubbery.

One of the most admirable birds, both as to quality of song and color of plumage, is the rose-breasted grosbeak. But this is not the sum total of his value to the berry grower. Hairless caterpillars, leaf rollers, wasps and flies are daily items on the bill of fare of this bird. On the ground, the grosbeak finds the army worm, grasshoppers and locusts. It also eats many weed seeds.

Small fruit plantations near thickets and tangled underbrush are visited by the ground robin or chewink. This black, brown and white fellow has a unique way of securing his food. It scratches with both feet at once, jumping into the air and digging away the leaves with a quick motion of the feet, then brings its feet deftly under its body to land on them. While scratching and digging among the leaves in early spring, it unearths many dormant insects, and disposes of them ere they have an opportunity to propagate their kind. Many beetle larvae are thus found, among them the white grub of the May beetle; many ground beetles, ants, the smaller nocturnal moths and hairy caterpillars are also consumed.

The Baltimore oriole is worth its weight in gold for its services in destroying both gypsy and brown-tail moths. The oriole is particularly fond or snap beetles or click beetles, the parents of the destructive wireworms. The very injurious May beetles and other leaf-eating beetles are taken by the oriole. Bagworms, curculios, wasps, bugs, plant lice, scale insects, March flies and crane flies are also consumed by this beautiful bird.

Robin Gets the Cutworm

The cutworm is the early worm that the robin gets. The robin finds the cutworms in the morning before they have crawled into their holes, and at night when they first venture out; and he digs them out of the earth at all hours of the day. His daily toll of insects include the caterpillar of the gypsy moth, the brown-tail moth and the forest tent moth; also cankerworms, tent caterpillars, curculios, leaf-eating and wood-boring beetles and ground beetles. Many wireworms are also swallowed, but the robin renders no greater service on the berry farm than the destruction of the white grub worms of the common buzzing "June bugs." This insect cuts off strawberry plants just below the ground, killing the plants and sometimes ruining whole beds. Nestling robins are fed on beetles, grasshoppers, crickets, moths, spiders, snails and katydids.

Another common harbinger of the spring is the bluebird, and this warbler ranks next to the robin as a cutworm destroyer, and at times it is an efficient caterpillar hunter.

The song sparrow is the most popular sparrow that we have and 50 per cent of its food during the year is composed of the seeds of weeds. It eats the seeds of chickweed, purslane, sorrel, dandelion, dock, crab grass and pigeon grass. Leaf hoppers, spittle insects, grasshoppers, locusts, crickets, click beetles, snails, flies and spiders are among the insect pests that are devoured.

The chipping sparrow that lives near our homes and builds in bushes near the porch feeds very largely on small caterpillars and is very useful in the orchard. Currant worms and moths are also extensively eaten.

Index to Advertisements

The concerns whose advertisements appear listed below are equipped to give prompt and satisfactory service to the American fruit grower. Most of them issue literature that is freely at the disposal of our subscribers. It is to the advantage of all that when writing to an advertiser you use the address exactly as it appears in the advertisement, and that you state in your letter: "I Read Your Advertisement in AMERICAN FRUIT GROWER MAGAZINE."

Note: Consult the CLASSIFIED DEPARTMENT (self indexed), on this page for Classification not listed below.

Orchard Heating

(*From Page Six*)

On frosty nights, the cold air lies in a thin layer near the ground, with warmer air above. The warmer air above the trees acts somewhat as a roof, and prevents the upward escape of the air that has been warmed by the heaters. The distance above the ground that we must go to find a temperature of 29 and 31 degrees, or whatever the danger point may be, determines the thickness of the layer of air that must be heated to maintain a safe temperature in the orchard.

We have found by experiment that the thickness of the cold air layer on frosty nights varies a great deal from night to night. Thus, we may have to heat a stratum of air 40 feet in depth one night, in order to raise the temperature of the air in the orchard five degrees. The next night we may have a cold air stratum only half as deep, and only the air within 20 feet of the ground will have to be heated to obtain the same temperature increase. Every orchardist who has had experience with orchard heating has noticed that the temperature can be raised with much less difficulty on some nights than on others.

It is obvious that a simple method of forecasting the depth of the cold air layer would be of considerable value because of its direct bearing on the amount of firing necessary to maintain a safe temperature in the orchard. Fortunately, there is a simple rule which can be applied in nearly every case. If a frosty night follows a warm afternoon, with the highest temperature above 65 degrees Fahrenheit, a given number of fires per acre will raise the temperature almost twice as many degrees as on a frosty night following a cold afternoon, with the highest temperature below 45 degrees Fahrenheit. In other words, the most difficult nights when protection is necessary are those following cold afternoons.

Another rule worth remembering in connection with frosty nights is the following: Other conditions being equal, the temperature will fall more rapidly and will reach a lower minimum on a dry night than on a damp night. If dew begins to form on vegetation when the temperature has fallen to 45 degrees Fahrenheit, the temperature fall during the remainder of the night usually will be comparatively slow. The lower the temperature at which dew begins to form, the more dangerous the night. A great deal of heat is liberated in the formation of dew, which causes the temperature to fall more slowly. Heat also is liberated when the moisture on vegetation or in the surface soil freezes. When the ground is wet from previous heavy rains, the fall in temperature is likely to be checked almost entirely when the freezing point is reached. After most of the ground moisture has been frozen, the temperature usually falls more rapidly.

Practical Points on Orchard Heating

The reinforcement of the border rows of trees in an orchard with an extra line of heaters is very important. If no border row of heaters is provided, the air drift will carry the heat from the first two or three rows of fires on the windward side into the orchard, leaving the outside rows practically unprotected. To secure protection for border trees, a row of heaters, 10 feet apart, should be placed about 20 feet to the windward of the outside row. The heaters in the border rows on the windward side of the orchard should be lighted first.

Orchard heater smoke has very little value in maintaining a safe temperature. The belief held by many fruit growers that the smoke "holds the heat down" is without basis. However, a smoke screen is of some value in shading the fruit and blossoms from the morning sun and preventing a too rapid thawing.

"Lord, She Was Thin"

An American was prowling around a Scottish churchyard. His eyes caught the epitaph "Lord, she was thin."

"Say, sexton, what d'ye make of that?" he asked.

"That's all right, sir; the sculptor went over near the edge of the stone and didna leave room for the 'e'."

RASPBERRY and BLACKBERRY CULTURE

After picking is over, weeds may be allowed to come up, or the ground prepared and a cover crop of oats, barley, millet or buckwheat sown. Late cultivation is not to be encouraged because it induces a succulent, immature growth that will be susceptible to winter injury. Some growers prefer to throw a furrow up to the canes in the fall as a protection and then work it away in the spring. This will serve both to narrow the rows of red raspberries or blackberries, where they have been allowed to get too wide, and to check the growth of grass and weeds among the plants.

A cover crop that winter kills will generally be less troublesome to plow under the following spring. Preferably use a crop that will make a heavy stand of vegetation to turn under, thus giving a maximum amount of green manure. The value of certain crops as cover crops varies considerably in different localities. Buckwheat, millet, rape, barley, rye, clover and winter vetch may all be used as cover crops but will not prove equally successful under all conditions. Bearing in mind the need of bramble fruits for organic matter in the soil, the cover crop should be chosen with a view to supply-

(*From Page Five*)

ing as much green manure, and as economically, as possible. The ease of working the soil, as well as the danger of robbing the bushes of needed food and moisture by a spring-growing cover crop, are also to be considered. Crops that live over winter are best drilled in, so that the seed may not be scattered between the bushes in the row, where it would be difficult to eradicate the growth.

Fertilization

Little of an exact nature is known in regard to the fertilization of raspberries and blackberries. In fact, successful fertilization is so much a local problem that each grower must practically solve it for himself.

Studies at the Cornell station have indicated that on a heavy soil not well adapted to these fruits, neither blackberries nor black raspberries give any definite response to the application of phosphorus, potash or nitrogen. The red raspberries, on the same soil, made more cane growth where nitrate of soda was applied. The yield, however, was not increased nearly as much as was the shoot growth. No benefit was noticed from the other fertilizers. Corn, on this same land, showed a remarkable response to phosphorus. Therefore we may conclude that where farm crops do reasonably well without fertilizer, it will scarcely pay to fertilize the brambles.

On poor soils, however, where cane growth is unsatisfactory, no doubt nitrate of soda or a similar product would be beneficial. An application of from 300 to 400 pounds nitrate of soda to the acre, or from 35 to 50 pounds to 100 feet of row, is suggested in the spring of the year as the buds are showing green. Burning will result if used later when the shoots are coming up, unless very carefully applied to keep it away from the green and tender parts.

The outstanding thing in connection with the fertilization of the bramble fruits is the importance of organic matter and humus. The careful grower, by turning under cover crops and by a liberal application of manure, will insure a high state of fertility and an ample supply of humus in the soil before planting. Furthermore, the patch will come into fruiting earlier because of this better preparation.

Unless the grower has found, by actual experience, that the contrary is true, it is probable that applications of manure are the best means of maintaining the soil fertility and the humus supply in the small-fruit plantation.

Pruning

A pruning practice commonly applied to all the brambles is the removal of the old canes soon after the crop is harvested, when they are of no further use and only tend to spread disease to the new shoots. The old canes are cut off close to the ground. For this purpose a brush hook is often used, while some prefer a pair of extra-long-handled lopping shears.

With black raspberries, purple canes and blackberries, summer pinching of the new shoots is generally practiced by commercial growers. Thus the tip ends of the new shoots are pinched off when they have reached a height of about two feet. Purple canes and blackberries are sometimes pinched from 24 to 36 inches. The pinching back is usually done early in June, and checks the immediate elongation of the shoots, forcing the buds along the main stems to push out and form lateral branches. Plants so treated are much lower and more self-supporting. This kind of pruning is almost always employed where trellises are not used. The pinching keeps the bushes more compact and easier to tend, and to this extent takes the place of artificial support.

Red raspberries are not usually summer pinched, as they are apt to send out weak, spindling laterals, which are less desirable than the straight, vigorous, well-matured canes. Then, too, this practice seems to further encourage the growth of suckers in red raspberries.

The regular dormant pruning is best given in the spring of the year, after all danger of winter injury is past. At this time the lateral branches on black raspberries and purple canes are cut back rather severely. It seems best to trim them short, leaving only about four inches of cane, and thereby improving the size of the fruit; unusually heavy canes may be left somewhat longer. Blackberries may be left twice that length. The spindling canes, smaller than the thickness of a lead pencil, are cut out entirely. Red raspberries should be cut back to about four feet in height. The weaker canes in each hill are pruned out, or where grown in the hedgerow, the canes may be spaced about six or eight inches apart. For convenience in management, the narrow hedgerow, not more than a foot wide, is to be preferred to a wider row.

Dewberries are commonly set in check rows, five by five or six by six feet, with a stake, usually about five feet high, at each plant. As soon as the crop is harvested, the old vines are cut out, and the patch is cultivated in one direction until the new canes seriously interfere. Then cultivation is discontinued, and the new canes grow at will upon the ground. The next spring the strongest of them are tied up and cut back about the height of the stake.

Harvesting

Blackberries, raspberries and dewberries are all very perishable and need to be carefully handled, especially the red raspberry. Picking should be done frequently, probably every other day at the height of the season, to insure that as large a proportion of berries as possible are of the right state of ripeness. This usually necessitates the help of a half dozen or more pickers to the acre. The berries should be firm, but not green nor yet over-ripe; and above all, they should not be picked while wet. They should be placed at once in the container in which they are to be marketed, without further handling. This requires some grading on the part of the pickers as they pick, and all over-ripe berries, or those injured in any way, should either be discarded or kept separate.

The 32-quart American crate with the split basket is the most popular type of package for all the bush fruits, except the red raspberries. Its advantages are convenieat size, better ventilation of the fruit, and less bruising. For the more perishable red raspberries, the pint box is in favor. The berries carry better on account of the reduced weight of fruit in each container, and better prices can generally be realized, for the pints usually sell for considerably more than half as

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The FRUIT MARKET REVIEW

(From Page Ten)

refrigeration were about 30 per cent heavier than a year ago and 13 per cent above the five-year average for December. Supplies of barreled apples were 41 per cent greater than in December, 1927, but were 26 per cent below the average figure because of the exceptionally heavy eastern crop produced in 1926. The number of boxes in cold storage houses in Pacific Coast states was 11,590,000, or about 70 per cent of the total holdings in boxes. The supply of boxed apples under refrigeration was 26 per cent above last season's corresponding figure and 30 per cent more than the December 1 average. Baskets were in 29 per cent greater supply than a year ago and were 114 per cent above average for this time of the season.

European Apple Markets

Prospects are good for a heavy consumption of American apples in Holland, Germany, Denmark and Sweden during the next few months. In general the continental market outlook is better than usual for barreled stock and normal for boxed varieties. The only exception will be found in Norway, where the duty on apples is prohibitive. Demand in Northwestern Europe is especialy strong for 2¼-inch to 2¾-inch barreled apples, on account of the short supplies of cheap home-grown fruit. Sweden was temporarily heavily supplied, but industrial conditions and buying power are much better than a year ago. All of the countries of Northwestern Europe were experiencing low prices for boxed Jonathans from the Pacific Northwest. This was due largely to the heavy supplies that arrived in an over-ripe condition. The eating quality of the fruit, however, was good. The moderate retail prices now prevailing should react favorably for heavy consumption generally in the near future. There has been only light trading in boxed Winesaps this season, because of the situation in the Pacific Northwestern Jonathan market.

The United Kingdom also evidenced favorable purchasing markets for barreled apples arriving in good, firm condition. Some shipments were being received at Liverpool without the mark indicating the country of origin, as required by British law after November 11. Fairly large quantities of barreled American apples were arriving over-ripe and in poor condition, both in British and in German markets. Among the boxed apples, Oregon Yellow Newtown, Spitzenburg and Delicious met an especially strong demand on the Liverpool auction.

Citrus Movement Increasing

Some concern was felt among Florida citrus growers as a result of the low temperatures in that state about November 22. However, citrus fruit apparently escaped injury, and some believe that the crop was benefited by the cold weather.

Movement of oranges from Florida, California and other states was becoming very active, and grapefruit shipments were gaining, though occasional decreases occurred. By early December, the weekly volume of oranges had reached 3000 cars, with grapefruit averaging close to 1000. Movement of grapefruit from Florida is running one-fourth heavier than during the early part of last season, and Texas probably will establish new records, as weekly output of that state increased to 100 cars. Direct boat shipments of Florida citrus fruit from Jacksonville to England are again being made this season. The Liverpool auction price had declined to about $4 per box. Central California orange shipments to date are three times those of a year ago, and total weekly forwardings from California had increased to 1700 cars, compared with 1200 from Florida.

A leading co-operative organization of citrus growers in California reported record-breaking f. o. b. returns of nearly $96,600,000 for the 1927-28 season, even though the number of boxes shipped was only 19,493,000, as against 22,267,000 the season before. Cost of marketing, exclusive of advertising, was 8.34 cents per box. A deduction of five cents per box of oranges and grapefruit, and 10 cents per box of lemons was made for nation-wide advertising purposes.

Crop Reports Delayed

Final production estimates on fruit and other farm crops were not scheduled for release by the Department of Agriculture until about mid-December, and the figures will not appear in this paper until February. It was not believed, however, that the crop figures would show very material changes from those of November.

Raspberry and Blackberry Culture

(From Page Twenty)

much as the quart containers sell for.

Varieties

The varieties of berries to plant is primarily a local problem. Outside of comparatively few varieties which have a wide range of adaptation, the majority are not widely known beyond certain rather restricted areas. The question is an important one, for commercial success depends, to no small extent, on the proper choice of varieties.

The purple cane, because of their superior hardiness and resistance to disease, are fast displacing the reds and the blacks in certain sections. They are not as readily salable except to the canneries, and their price is somewhat less than that of the other berries, but this is at least partially offset by their larger yields and greater immunity to disease.

Yields vary from less than 1000 quarts, where diseases, insects, or winter injury are prevalent, to 3000 or 4000 quarts an acre. The yields on the better plantations probably average 1800 quarts for reds, 2000 for blacks, 2200 for purple canes, and 2500 for blackberries. Most growers add to their returns by the sale of plants.

Disease Susceptibility

The growing of raspberries at the present time is hindered by the great prevalence of the mosaic disease, commonly called "yellows." This disease has been largely spread by infected nursery stock, and some varieties, notably Perfection and Marlboro, appear now to be completely infected by it, so that it is not possible to obtain disease-free stock. This disease does not kill the plants entirely, but it is an aggravating trouble to contend with, for it greatly reduces the yields and causes the fruit to ripen early, to crumble, and to lose its characteristic flavor. The red varieties seem to have suffered more extensively than the black-caps from this disease.

For these reasons then, in planting raspberries it is well to find out from your state experiment station the disease susceptibility of different varieties and best methods of control.

Novelties

The grower and the amateur alike should be cautioned against planting novelties and varieties unsuited to their conditions, such as the Himalaya berry, the loganberry, the wineberry, and the strawberry-raspberry. The first two of these are entirely unsatisfactory outside of the Far West. The wineberry, while rather attractive in appearance, is of no commercial promise, being tender and unproductive. The strawberry-raspberry has little to recommend it, except, possibly, its ornamental value.

Walter F. Kirk, one of the leading farmers and fruit growers of Ottawa county, Ohio, was recently made master of the Ohio State Grange. Mr. Kirk is a former state representative and served for a number of years as a member of the state grange organization.

Stranger—I represent a society for the suppression of profanity. I want to take profanity entirely out of your life.

Boy—Hey, mother! Here's a man who wants to buy our automobile.

American Fruit Grower Magazine for January

THIS MAGAZINE has been asked to lend aid, by the publication of prepared articles, in the organization of a "national grower-owned-and-operated organization," designed to promote and protect the economic interests of commercial fruit growers. The organization would, according to its sponsors, represent the fruit industry in such matters as transportation, legislation, etc. The organization was initiated by the Indiana Fruit Growers' Association, who last December voted fifty dollars to defray the cost of feeling out the sentiment among other similar organizations and among fruit growers generally.

No New National Organization Necessary

Whatever may have been the results of this exhaustive survey, the active spirits behind the movement met during the summer, perfected a form of organization, and appointed fifteen fruit men, including themselves, as directors.

The president of this movement, an able and engaging speaker, secured time on several horticultural society programs to explain the purposes of his organization.

Any movement such as this, having for its aim the benefit of the commercial fruit industry, naturally engages the keen interest of AMERICAN FRUIT GROWER MAGAZINE. The stated purposes of the organization, with a few debatable exceptions, are beyond criticism.

This magazine would unhesitatingly endorse the principle of such an organization were it not for the fact that there is now a national organization in the field, well organized, adequately financed and under most capable management.

The American Fruit and Vegetable Shippers' Association is exactly what its name implies. Within its membership are nearly all the larger fruit shipping associations and exchanges, co-operative and corporate.

It was organized and continues in existence for but one purpose; the protection of the interests of the shipper of fruits or produce. It functions capably, effectively.

True, its membership dues may appear at first glance to be a bit stiff: $50.00 to $500.00 per year, based on tonnage. But adequate service costs money these days. The Association is in constant touch with the railroads and is recognized by them as the spokesman of the fruit and vegetable shippers. It deals with railroad rates, rules and regulations and service. It is represented before transportation committees, and many a proposed rate increase is killed before birth by the activities of this Association. It successfully represents the fruit industry before the Interstate Commerce Commission.

At every session of Congress proposed bills affecting the fruit and produce industry are scanned, while representatives of the Association quietly work for or against measures as the necessities of each occasion demand.

The American Fruit and Vegetable Shippers' Association carefully avoids methods out of keeping with its recognized high national standing. It works. Every year sees some distinct advance in the economic interests of the industry due to its efforts.

Another organization in the field, to be composed of small co-operatives and scattered fruit growers, could accomplish nothing that is not now being done. There is no strength in divided effort.

Any change of fruit tariff schedules, or any "farm relief" program, or any other economic proposal affecting the fruit industry that cannot win the endorsement of the Association would be of only doubtful value, if not a genuine injury, to the commercial fruit industry.

It would be better at this time to strengthen the hands of the existing organization rather than to attempt a feeble duplication of its efforts.

We would recommend to the consideration of the Board of Directors of the American Fruit and Vegetable Shippers' Association that some thought be given to the idea of attracting to its membership isolated commercial fruit growers having carlot production. The membership cost in this case might well be adjusted to a lower tonnage basis. This would round out the proper field of the Association, though it might not materially increase the tonnage now represented by its membership—about 600,000 cars out of the million cars annually shipped.

In This Issue

BY "SPRAY COVERAGE" we mean the number of trees of a certain size that a given amount of spray material will cover. There seems to be convincing evidence that there is a wide difference in the spray coverage of different spray materials. For instance, we are told that in one orchard 21 spray tanks of oil emulsion were required to spray the same trees that only 16 spray tanks of lime-sulphur covered the year previous. In another orchard, 25 spray tanks of oil emulsion were needed to spray the same trees that ordinarily required 16 tanks of lime-sulphur. Apparently there is no doubt that more dilute oil emulsion than lime-sulphur is required to spray a given orchard.

Has Spray Coverage Been Ignored

There also seems an even greater difference in the covering power of different oil sprays, due no doubt to difference in percentages and kinds of oils contained in the various oil sprays. Where 25 spray tanks of oil emulsion and 16 spray tanks of lime-sulphur were required, only eight spray tanks of miscible oil were necessary to spray the same trees.

This subject of spray coverage deserves more study. If it requires twice as many spray tanks of one kind of spray material as another, it is important for the fruit grower to know it. Especially is it important in applying the dormant spray, because a saving in the number of tankfuls sprayed means a proportionate saving in time and labor.

In one instance it was reported that 132 spray tanks of miscible oil sprayed the same trees that required 368 spray tanks of oil emulsion. Yet it is not generally recognized that there is any considerable difference in the spray coverage of different dormant sprays. Fruit growers who keep accurate records of their spraying operations would be conferring a distinct favor on their fellow fruit growers by reporting their experiences to us.

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